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Nitrogen News is a summary of recent publications, news and reports related to the cycling, effects and management of nitrogen. Prepared by Mary O'Brien and Jana Compton. Contact Jana Compton with any questions (Compton.jana@epa.gov)

News

Agricultural industry, Feds spar over source of Gulf hypoxia

Water Policy Report, June 22, 2009

http://insideepa.com/secure/docnum.asp?docnum=WATER-18-13-14&f=epa_2001.ask

Gulf of Mexico: Summer 'dead zone' could be largest on record – NOAA

Greenwire, June 18, 2009

<http://www.eenews.net/Greenwire/2009/06/18/archive/22?terms=nitrogen>

Researchers predict large 2009 Gulf of Mexico 'dead zone' Chesapeake Bay's oxygen-starved zone likely to shrink

Newswise Science News, June 18, 2009

<http://www.newswise.com/articles/view/553538/>

Study highlights massive imbalances in global fertilizer use

EurekAlert!, June 18, 2009

http://www.eurekalert.org/pub_releases/2009-06/su-shm061609.php

Water pollution: Flow of nutrients to northern Gulf of Mexico highest in three decades, USGS study finds

Daily Environment Report, June 17, 2009

http://news.bna.com/deln/DELNWB/split_display.adp?fedfid=13007266&vname=dennotallissue&wsn=496968000&searchid=8391061&doctypeid=1&type=date&mode=doc&split=0&scm=DELNWB&pg=1

Purdue-developed tool can get most pollution control for the money

Purdue University News, June 15, 2009

<http://news.uns.purdue.edu/x/2009a/090615ChaubeyPollution.html>

UC Davis begins \$2.8 million in studies of agricultural nitrogen's impacts

EurekAlert!, June 11, 2009

http://www.eurekalert.org/pub_releases/2009-06/uoc--udb061109.php

USGS study may aid EPA bid to set numeric nutrient limits for Miss. River

InsideEPA.com, Risk Policy Report, June 9, 2009

http://insideepa.com/secure/docnum.asp?docnum=RISK-16-23-9&f=epa_2001.ask

New proxy reveals how humans have disrupted the nitrogen cycle

EurekAlert!, June 4, 2009

http://www.eurekalert.org/pub_releases/2009-06/bu-npr052609.php

Seizing a Watershed Moment; USDA's Farm Conservation Program a Promising But Unfocused Remedy for Water Pollution and the Gulf 'Dead Zone'

Environmental Working Group News Release, May 27, 2009

<http://www.ewg.org/news-release/EQIP-Water-Quality-Mississippi-River-States>

Nutrient Concentrations Remained Stable in Many Streams from 1993 to 2003

The U.S. Geological Survey National Water-Quality Assessment program conducted [national- and regional-scale trend assessments \(1993 to 2003\) of nutrient concentrations and loads in streams](#) and how these trends corresponded to changes in streamflow and nutrient sources, such as fertilizer applications, animal manure, population, and atmospheric deposition. Phosphorus and nitrogen concentrations remained relatively stable in about half of the streams assessed nationwide from 1993 to 2003; however, the pattern did vary in some regions, including increases in phosphorus concentrations in more than half of the streams assessed in the Mississippi/Atchafalaya River Basin. Linking trends in stream nutrient levels to changes in nutrient sources will enhance our understanding of the effectiveness of land management actions.

Special Issues

Harmful Algae, 8(5): 692-698, 706-725, 736-743, 770-816, June 2009. ISSN 1568-9883.

<http://www.sciencedirect.com/science/journal/15689883>

Hydrobiologia, 629(1): 1-269, August 2009. ISSN 1573-5117.

Eutrophication in Coastal Ecosystems: Selected papers from the Second International Symposium on Research and Management of Eutrophication in Coastal Ecosystems, 20–23 June 2006, Nyborg, Denmark / Guest Editors: J.H. Andersen & D.J. Conley

<http://www.springerlink.com/content/1573-5117>

Journal of Great Lakes Research, 35(Supplement 1): 1-118, 2009. ISSN 0380-1330.

Special issue on Watershed Management and Nearshore Lake Water Quality, The Conesus Lake Watershed Study.

Edited by Joseph Makarewicz, Isidro Bosch and Marley Waiser

Sponsored by US. Department of Agriculture, the cooperative state research, education and extension service (CSREES)

<http://www.sciencedirect.com/science/journal/03801330>

Marine Pollution Bulletin, 59(4-7): 87-218, 2009. ISSN 0025-326X.

Environmental Records of Anthropogenic Impacts on Coastal Ecosystems.

Edited by Joan-Albert Sanchez-Cabeza and Ellen R.M. Druffel

<http://www.science-direct.com/science/journal/0025326X>

Articles

Abell, Jeffrey, Anniet M. Laverman, and Philippe Van Cappellen.

Bioavailability of organic matter in a freshwater estuarine sediment: long-term degradation experiments with and without nitrate supply.

Biogeochemistry, 94(1): 13-28, May 2009. ISSN 1573-515X.

<http://dx.doi.org/10.1007/s10533-009-9296-x>

Aneja, Viney P., William H. Schlesinger, and Jan Willem Erisman.

Effects of agriculture upon the air quality and climate: research, policy, and regulations.

Environmental Science & Technology, 43(12):4234-4240, June 15, 2009. ISSN 0013-936X.

<http://dx.doi.org/10.1021/es8024403>

Baron, Jill S., Travis M. Schmidt, and Melannie D. Hartman.

Climate-induced changes in high elevation stream nitrate dynamics.

Global Change Biology, 15(7): 1777-1789, July 2009. ISSN 1354-1013.

<http://dx.doi.org/10.1111/j.1365-2486.2009.01847.x>

Bougon, N. L. Aquilina, M. P. Briand, S. Coedel, and P. Vandenkoornhuyse.

Influence of hydrological fluxes on the structure of nitrate-reducing bacteria communities in a peatland.

Soil Biology & Biochemistry, 41(6): 1289-1300, June 2009. ISSN 0038-0717.

<http://dx.doi.org/10.1016/j.soilbio.2009.03.015>

Butler, Timothy M. and Mark G. Lawrence.

The influence of megacities on global atmospheric chemistry: a modelling study.

Environmental Chemistry, 6(3): 219-225, 2009. ISSN 1448-2517.

<http://dx.doi.org/10.1071/EN08110>

Chen, Fajin, Guodong Jia, and Jianyao Chen.

Nitrate sources and watershed denitrification inferred from nitrate dual isotopes in the Beijiang River, south China.

Biogeochemistry, 94(2): 163-174, June 2009. ISSN 1573-515X.

<http://dx.doi.org/10.1007/s10533-009-9316-x>

Chronakova, Alica, Viviane Radl, Jiri Cuhel, Miloslav Simek, Dana Elhottova, Marion Engel, and Michael Schlöter.

Overwintering management on upland pasture causes shifts in an abundance of denitrifying microbial communities, their activity and N₂O-reducing ability.

Soil Biology & Biochemistry, 41(6): 1132-1138, June 2009. ISSN 0038-0717.

<http://dx.doi.org/10.1016/j.soilbio.2009.02.019>

Chung, Haegeun, Donald R. Zak, and Peter B. Reich.

Microbial assimilation of new photosynthate is altered by plant species richness and nitrogen deposition.

Biogeochemistry, 94(3): 233-242, July 2009. ISSN 1573-515X.

<http://dx.doi.org/10.1007/s10533-009-9321-0>

Clark, Christopher M. Sarah E. Hobbie, Rodney Venterea, and David Tilman.

Long-lasting effects on nitrogen cycling 12 years after treatments cease despite minimal long-term nitrogen retention.

Global Change Biology, 15(7): 1755-1766, July 2009. ISSN 1354-1013.

<http://dx.doi.org/10.1111/j.1365-2486.2008.01811.x>

Diebel, Matthew W. and M. Jake Vander Zanden.

Nitrogen stable isotopes in streams: effects of agricultural sources and transformations.

Ecological Applications, 19(5): 1127-1134, July 2009. ISSN 1051-0761.

<http://dx.doi.org/10.1890/08-0327.1>

Dinsmore, Kerry J., Ute M. Skiba, Michael F. Billett, Robert M. Rees, and Julia Drewer.

Spatial and temporal variability in CH₄ and N₂O fluxes from a Scottish ombrotrophic peatland: Implications for modelling and up-scaling.

Soil Biology & Biochemistry, 41(6): 1315-1323, June 2009. ISSN 0038-0717.

<http://dx.doi.org/10.1016/j.soilbio.2009.03.022>

Fang, Yunting, Per Gundersen, Wei Zhang, Guoyi Zhou, Jesper Riis Christiansen, Jiangming Mo, Shaofeng Dong and Tao Zhang.

Soil-atmosphere exchange of N₂O, CO₂ and CH₄ along a slope of an evergreen broad-leaved forest in southern China.

Plant and Soil, 319(1-2), June 2009. ISSN 1573-5036.

<http://dx.doi.org/10.1007/s11104-008-9847-2>

Flynn, Amanda McGuirk.

Organic matter and nutrient cycling in a coastal plain estuary: carbon, nitrogen, and phosphorus distributions, budgets, and fluxes.

Journal of Coastal Research, Sp. Iss. 55:76-94, Summer 2009. ISSN 0749-0208.

<http://dx.doi.org/10.2112/SI55-010.1>

Gardner, Wayne S. and Mark J. McCarthy.

Nitrogen dynamics at the sediment-water interface in shallow, sub-tropical Florida Bay: why denitrification efficiency may decrease with increased eutrophication.

Biogeochemistry, article in press, published online May 26, 2009. ISSN 1573-515X.

<http://dx.doi.org/10.1007/s10533-009-9329-5>

Hatfield, J. L., L.D. McMullen, and C. S. Jones.

Nitrate-nitrogen patterns in the Raccoon River Basin related to agricultural practices.

Journal of Soil and Water Conservation, 64(3): 190-199, May-June 2009. ISSN 0022-4561.

<http://dx.doi.org/10.2489/jswc.64.3.190>

Hiriart-Baer, Veronique P., Jacqui Milne, and Murray N. Charlton.

Water quality trends in Hamilton Harbour: two decades of change in nutrients and chlorophyll a.

Journal of Great Lakes Research, 35(2): 293-301, June 2009. ISSN 0380-1330.
<http://dx.doi.org/10.1016/j.jglr.2008.12.007>

Holstein, Jan M. and Kai W. Wirtz.

Sensitivity analysis of nitrogen and carbon cycling in marine sediments.

Estuarine, Coastal, and Shelf Science, 82(4): 632-644, May 20, 2009. ISSN 0272-7714.
<http://dx.doi.org/10.1016/j.ecss.2009.02.008>

Hoos, A.B., and Gerard McMahon.

Spatial analysis of instream nitrogen loads and factors controlling nitrogen delivery to streams in the southeastern United States using spatially referenced regression on watershed attributes (SPARROW) and regional classification frameworks.

Hydrologic Processes. ISSN 1099-1085.

accessed June 25, 2009, at <http://dx.doi.org/10.1002/hyp.7323>

PDF of article (publicly available):

http://tn.water.usgs.gov/pubs/ja/ABH/SPARROW_2009_JA.pdf

Jacobson, Mark Z., and David G. Streets.

Influence of future anthropogenic emissions on climate, natural emissions, and air quality.

Journal of Geophysical Research - Atmospheres, 114(D08118), 2009. ISSN 0148-0227.

<http://dx.doi.org/10.1029/2008JD011476>

Katz, Brian G., A. Alejandro Sepulveda, and Richard J. Verdi.

Estimating Nitrogen Loading to Ground Water and Assessing Vulnerability to Nitrate Contamination in a Large Karstic Springs Basin, Florida.

JAWRA Journal of the American Water Resources Association, 45(3): 607 - 627, June 2009. ISSN 1752-1688.

<http://dx.doi.org/10.1111/j.1752-1688.2009.00309.x>

Knapp, Charles W., Walter K. Dodds, Kymberly C. Wilson, Jonathan M. O'Brien, and David W. Graham.

Spatial heterogeneity of denitrification genes in a highly homogenous urban stream.

Environmental Science & Technology, 43(12):4273-4279, June 15, 2009. ISSN 0013-936X.

<http://dx.doi.org/10.1021/es9001407>

Lal, Harbans, Jorge A. Delgado, Christoph M. Gross, Eric Hesketh, Shaun P. McKinney, Harris Cover, and Marv Shaffer.

Market-based approaches and tools for improving water and air quality.

Environmental Science & Policy, article in press, corrected proof, available online June 30, 2009. ISSN 1462-9011.

<http://dx.doi.org/10.1016/j.envsci.2009.05.003>

Liu, Chen, Qinxue Wang, Alin Lei, Yonghui Yang, Zhu Ouyang, Yaoming Lin, Yan Li, and Kelin Wang.

Identification of anthropogenic parameters for a regional nitrogen balance model via field investigation of six ecosystems in China.

Biogeochemistry, 94(2): 175-190, June 2009. ISSN 1573-515X.

<http://dx.doi.org/10.1007/s10533-009-9317-9>

Marcarelli, Amy M. and Wayne A. Wurtsbaugh.

Nitrogen fixation varies spatially and seasonally in linked stream-lake ecosystems.

Biogeochemistry, 94(2): 95-110, June 2009. ISSN 1573-515X.

<http://dx.doi.org/10.1007/s10533-009-9311-2>

Mills, Katherine, Michael J. Kennish, and Kenneth A. Moore.

Research and monitoring components of the national estuarine research reserve system.

Journal of Coastal Research, Sp. Iss. 55:1-8, Summer 2009. ISSN 0749-0208.

<http://dx.doi.org/10.2112/SI55-012.1>

Mulholland, Margaret R., Ryan E. Morse, George E. Boneillo, Peter W. Bernhardt, Katherine C. Filippino, Procise, Leo A., Jose L. Blanco-Garcia, Harold G. Marshall, Todd A. Egerton, William S. Hunley, Kenneth A. Moore, Dianna L. Berry, and Christopher J. Gobler.

Understanding Causes and Impacts of the Dinoflagellate, *Cochlodinium polykrikoides*, Blooms in the Chesapeake Bay.

Estuaries and Coasts, 32(4): 734-747, July 2009. ISSN 1559-2723.

<http://dx.doi.org/10.1007/s12237-009-9169-5>

Mulholland, Patrick J., Brian J. Roberts, Walter R. Hill, and John G. Smith.

Stream ecosystem responses to the 2007 spring freeze in the southeastern United States: unexpected effects of climate change.

Global Change Biology, 15(7): 1767-1776, July 2009. ISSN 1354-1013.

<http://dx.doi.org/10.1111/j.1365-2486.2009.01864.x>

Paerl, Hans W.

Controlling eutrophication along the freshwater-marine continuum: dual nutrient (N and P) reductions are essential.

Estuaries and Coasts, 32(4): 593-601, July 2009. ISSN 1559-2723.

<http://dx.doi.org/10.1007/s12237-009-9158-8>

Randhir, Timothy O. and Olga Tsvetkova.

Watershed-scale tradeoffs in water quantity and quality attributes for conservation policy.

Water, Air, and Soil Pollution, 201(1-4): 347-363, July 2009. ISSN 0049-6979.

<http://dx.doi.org/10.1007/s11270-008-9949-8>

Roebeling, P. C., E. M. T. Hendrix, and M. E. van Grieken.

Exploring industry specific social welfare maximizing rates of water pollution abatement in linked terrestrial and marine ecosystems.

Journal of Coastal Research, Sp. Iss. 56:1681-1685, 2009. ISSN 0749-0208.

Saari, Paivi, Sanna Saarnio, Jussi V. K. Kukkonen, Jarkko Akkanen, Jaakko Heinonen, Veli Saari, and Jukka Alm.

DOC and N₂O dynamics in upland and peatland forest soils after clear-cutting and soil preparation.

Biogeochemistry, 94(3): 217-231, July 2009. ISSN 1573-515X.

<http://dx.doi.org/10.1007/s10533-009-9320-1>

Scavia, Donald and Yong Liu.

Exploring estuarine nutrient susceptibility.

Environmental Science and Technology, 43(10): 3474-3479, May 15, 2009. ISSN 1520-5851.

<http://dx.doi.org/10.1021/es803401y>

Shen, J.L., A.H. Tang, X.J. Liu, A. Fangmeier, K.T.W. Goulding, and F.S. Zhang.

High concentrations and dry deposition of reactive nitrogen species at two sites in the North China Plain.

Environmental Pollution, article in press, corrected proof, available online May 30, 2009. ISSN 0269-7491.

<http://dx.doi.org/10.1016/j.envpol.2009.05.016>

Siciliano, Steven D., Wai K. Ma, Susan Ferguson, and Richard E. Farrell.

Nitrifier dominance of Arctic soil nitrous oxide emissions arises due to fungal competition with denitrifiers for nitrate.

Soil Biology & Biochemistry, 41(6): 1104-1110, June 2009. ISSN 0038-0717.

<http://dx.doi.org/10.1016/j.soilbio.2009.02.024>

Sobota, Daniel J., John A. Harrison, and Randy A. Dahlgren.

Influences of climate, hydrology, and land use on input and export of nitrogen in California watersheds.

Biogeochemistry, 94(1): 43-62, May 2009. ISSN 1573-515X.

<http://dx.doi.org/10.1007/s10533-009-9307-y>

Tripathi, S. K.

Human influences on mobility of nitrogen in the environment: Needs for research and management.

Acta Ecologica Sinica, article in press. ISSN 1872-2032.

doi: 10.1016/j.chnaes.2009.05.009

Vijayaraghavan, K., Y. Zhang, C. Seigneur, P. Karamchandani, and H. E. Snell.

Export of reactive nitrogen from coal-fired power plants in the U.S.: Estimates from a plume-in-grid modeling study.

Journal of Geophysical Research - Atmospheres, 114(4): D04308, 2009. ISSN 0148-0227

doi: 10.1029/2008JD010432

Worrall, F., E. Spencer, and T. P. Burt.

The effectiveness of nitrate vulnerable zones for limiting surface water nitrate concentrations.

Journal of Hydrology, 370(1-4): 21-28, May 30, 2009. ISSN 0022-1694.

<http://dx.doi.org/10.1016/j.jhydro1.2009.02.036>

Wu, Shuo-Sheng "Derek", E. Lynn Usery, Michael P. Finn, and David D. Bosch.
Effects of sampling interval on spatial patterns and statistics of watershed nitrogen concentration.

GIScience & Remote Sensing, 46(2): 172-186, April-June 2009. ISSN 1548-1603.
<http://dx.doi.org/10.2747/1548-1603.46.2.172>

Zaman, M., S. Saggar, J. D. Blennerhassett, and J. Singh.
Effect of urease and nitrification inhibitors on N transformation, gaseous emissions of ammonia and nitrous oxide, pasture yield and N uptake in grazed pasture system.
Soil Biology & Biochemistry, 41(6): 1270-1280, June 2009. ISSN 0038-0717.
<http://dx.doi.org/10.1016/j.soilbio.2009.03.011>

Reports

Hypoxia in the Gulf: An Analytical White Paper

For the National Corn Growers Association by StrathKirn Inc. April 2009.
<http://www.ncga.com/files/pdf/2009HypoxiaJune16.pdf>

Streamflow and Nutrient Delivery to the Gulf of Mexico for October 2008 to May 2009 (Preliminary)

Washington, DC: USGS, June 2009.
http://toxics.usgs.gov/hypoxia/mississippi/oct_jun/index.html
Source: USGS Toxic Substances Hydrology Program

Streamflow and Nutrient Flux of the Mississippi-Atchafalaya River Basin and Subbasins Through Water Year 2008

Washington, DC: USGS, June 2009.
http://toxics.usgs.gov/hypoxia/mississippi/flux_ests/index.html
Source: USGS Toxic Substances Hydrology Program

Seizing a watershed moment: Making EQIP work for water quality in 10 Mississippi River border states

Washington, DC: Environmental Working Group, May 2009
<http://www.ewg.org/conservation/report/EQIP-Water-Quality-Mississippi-River-States>

Spatial Analysis of Instream Nitrogen Loads and Factors Controlling Delivery to Streams in the Southeastern United States using Spatially Referenced Regression on Watershed Attributes (SPARROW) and Regional Classification Frameworks

by Anne B. Hoos and Gerard McMahon
Washington, DC: U.S.G.S., 2009.
http://water.usgs.gov/nawqa/pubs/nitrogen_loads/
Source: National Water-Quality Assessment (NAWQA) Program

Web Sites

CSCOR-supported research provides foundation for effective management of the "dead zone" in the northern Gulf of Mexico

http://www.cop.noaa.gov/stressors/extremeevents/hab/features/hypoxiafs_report1206.html

Source: NOAA Center for Sponsored Coastal Ocean Research (CSCOR)

Hypoxia in the northern Gulf of Mexico

<http://gulfhypoxia.net/>

Source: Louisiana Universities Marine Consortium (LUMCON)

Scavia, Don.

Gulf of Mexico 2009 Forecasts and Results; Chesapeake Bay 2009 Forecasts and Results

http://sitemaker.umich.edu/scavia/hypoxia_forecasts

Source: University of Michigan Natural Resources and Environment